

CLAIMS:

1. A clutch device (10) for an automatic transmission (22, 24, 36, 44), comprising (a) a clutch drum (16) supporting frictional coupling elements (12, 14) on an inner circumferential surface thereof, (b) a clutch piston (18) disposed radially outwardly of the clutch drum, and (c) a rotary speed sensor (84) disposed radially outwardly of the clutch piston and operable to detect a rotating speed of the clutch piston, characterized in that:

said clutch piston (18) has an inner spline (82) for engagement with an outer spline (72) of said clutch drum (16) to prevent relative rotation between said clutch piston and said clutch drum; and

said clutch piston further has a plurality of recesses (86) formed in an outer circumferential surface thereof and corresponding to respective teeth of said inner spline (82), and a plurality of oil holes (80) formed therethrough at an axial position of the clutch device at which said rotary speed sensor (84) is located, said recesses (86) and said oil holes (80) being equally spaced apart from each other in a circumferential direction of said clutch piston, and cooperating to provide a sensed portion to be sensed by said rotary speed sensor.

2. The clutch device according to claim 1, wherein said clutch drum (16) has an inner spline (70) formed on an inner circumferential surface thereof for engagement with said frictional coupling elements (12, 14) so as to prevent relative

rotation between said clutch drum and said frictional coupling elements, as well as said outer spline (72) which is formed on an outer circumferential surface thereof and which corresponds to said inner spline (70) of said clutch drum,

and wherein said plurality of recesses (86) and said oil holes (80) of said clutch piston (18) are aligned with respective recesses (72a) of said outer spline (72) of said clutch drum in said circumferential direction.

3. The clutch device according to claim 1 or 2, wherein each tooth of said inner spline (82) has a large-height axial portion (82a) formed in a first axial portion thereof, and a small-height axial portion (82b) formed in a second axial portion thereof and having a smaller height than said large-height axial portion.

4. The clutch device according to any one of claims 1-3, wherein said clutch drum (16) has a plurality of oil holes (78) formed therethrough, and each of said oil holes (80) of said clutch piston (18) is located between two adjacent ones of said plurality of oil holes (78) of said clutch drum (16) in said circumferential direction.

5. The clutch device according to any one of claims 1-4, wherein said frictional coupling devices (12, 14) include a first group of frictional coupling elements (12) having a plurality of friction plates (32) supported by said clutch drum (16), and a second group of frictional coupling elements (14) having a plurality of

friction plates (38) supported by said clutch drum, said first group of frictional coupling elements being located in a first axial portion of said clutch drum in which said oil holes (80) and said rotary speed sensor (84) are located, while said second group of frictional coupling elements being located in a second axial portion of said clutch drum which is spaced from said first axial portion in an axial direction of said clutch drum.

6. The clutch device according to claim 5, wherein said oil holes (80) located in said first axial portion of said clutch drum function as a first group of oil holes, and said clutch piston further has a second group of oil holes (88) located in said second axial portion.

7. The clutch device according to claim 5, further comprising a first clutch hub (36) and a second clutch hub (42) which are disposed radially inwardly of said clutch drum (16) and which are spaced apart from each other in said axial direction of said clutch drum, and wherein said first group of frictional coupling elements (12) further has a plurality of friction plates (34) supported by said first clutch hub, and said second group of frictional coupling elements (14) further has a plurality of friction plates (40) supported by said second clutch hub,

and wherein the friction plates (32) of said first group of frictional coupling elements (12) supported by said clutch drum (16) and the friction plates (34) of said first group of frictional coupling elements supported by said first clutch hub (36) are

alternately arranged in said axial direction of said clutch drum, while the friction plates (38) of said second group of frictional coupling elements (14) supported by said clutch drum and the friction plates (40) of said second group of frictional coupling elements supported by said second clutch hub (42) are alternately arranged in said axial direction of said clutch drum.

8. The clutch device according to claim 7, wherein said automatic transmission (22, 24, 36, 44) includes a ring gear (36) which functions as said first clutch hub.

9. The clutch device according to claim 7 or 8, wherein said automatic transmission (22, 24, 36, 44) includes a sun gear (44), and said second clutch hub (42) is fixed to said sun gear, for rotation with said sun gear.